IL7480.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF
(SR-6J)

May 29, 1999

Mr. D. Michael Light
Manager, Remedial Projects
Solutia, Inc.
10300 Olive Boulevard
P.O. Box 66760
St. Louis, Missouri 63166-6760

RE: Comments on April 8, 1999, Revised Support Sampling Plan
Sauget Area 1 Site, Sauget and Cahokia, Illinois

Dear Mr. Light:

The U.S. Environmental Protection Agency (U.S. EPA) has reviewed Solutia's April 8, 1999, revised Support Sampling Plan for the Sauget Area 1 Site. While the revised Sampling Plan addresses most of U.S. EPA's earlier comments, particularly relating to the absence of significant sections of the Sampling Plan (i.e., QAPP and Safety Plan), the Sampling Plan is still not approvable. Therefore, U.S. EPA is disapproving your April 8, 1999, revised Sampling Plan. Additional comments from U.S. EPA, including those from the U.S. Army Corps of Engineers, are attached to this letter. No comments were received, nor are any expected, from Illinois EPA. Please revise the Sampling Plan in accordance with the comments and provide U.S. EPA and Illinois EPA with a final plan on or before June 25, 1999.

If you have any questions regarding the attached comments, or if you wish to set up a meeting to go through any of the comments, please call me at 312/886-4663.

Sincerely,

Michael McAteer
Remedial Project Manager

cc: Thomas Martin, USEPA
Candy Morin, Illinois EPA
Tim Gouger, USACE
Kevin de la Bruere, USFWS
Michael Henry, Illinois DNR

f: sgf1_ss2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

COMMENTS ON APRIL 8, 1999, REVISED SUPPORT SAMPLING PLAN
SAUGET AREA 1 SITE

VOLUME 1A:

1. Solutia's Cover Page, Clarification Request No. 1: All seven steps must be identified in the QAPP. Please see Weston comment on page 2.

2. Solutia's Cover Page, Clarification Request No. 2: Solutia's understanding is correct regarding the fact that U.S. EPA will take the lead on community relations and public participation activities a the Site. Solutia's support and cooperation with Agency-lead community relations activities would be most appreciated.

3. Page 38, Section 5.1.2: Under the discussion for Cerro Copper, in the last sentence there is some information missing from the sentence.

4. Page 40, Section 5.1.2: Under the discussion for Monsanto, there is a general reference made to the manufacture of "various inorganic and organic chemicals." Solutia should be able to provide more detailed information than this. Please include a more detailed listing of the manufacturing processes conducted at the Krummrich plant.

5. Page 51, Section 5.3: If drums are located in the trenches and not removed using an alternate method to confined space entry, then the area where drums are located need to be surveyed into a database so that drum removal activities can possibly be conducted at a later date. For those drums that are removed, please describe in further detail the location, security measures, and time these drums will be stored on-site pending disposal.

6. Page 55, Section 5.6.2: Please note that U.S. EPA does not necessarily agree with Solutia's statement that drum and tank removals can wait until a remedy is implemented. It may be in everyone's best interest to conduct an early source removal action to address groundwater contamination problems *before* a remedy is implemented for the entire site.

7. Page 57, Section 6.2: U.S. EPA agrees that given our general knowledge about groundwater conditions, it would seem unlikely that groundwater flow would be in any direction other than westward toward the Mississippi River. However, it is still worthy of further investigation to fully define the extent of contamination keeping in mind that groundwater flow may be influenced by industrial users and flow reversals as a result of high flows on the Mississippi River.

8. Page 62, Section 6.5.1.3: The reference to the submittal of a report for bedrock groundwater sampling well locations is somewhat confusing. It would seem that decisions on the locations of

bedrock wells could be made in the field after consulting with U.S. EPA. Please explain why the submittal of a report and then waiting for review and acceptance would be more effective.

9. Page 70, Section 7.0: In the third paragraph please describe the timeline for collecting samples from the twenty stations in the developed areas after the sampling results are received from the 45 sampling stations in the undeveloped areas. The same comment applies to Section 7.3.

10. Page 86, Section 11.0: U.S. EPA does not necessarily agree with the statement that Dead Creek could not possibly be a habitat for certain species of fish. This statement needs to be more thoroughly checked in the field.

11. Page 99, Section 16.0 Schedule: A line item schedule must be submitted with the Support Sampling Plan. Please also note that U.S. EPA will not approve Solutia's Support Sampling Plan with a schedule that shows a duration of 390 days for collecting and analyzing soil, sediment, surface water, groundwater and air samples. Nor will U.S. EPA approve Solutia's Support Sampling Plan with a schedule that shows a duration of 210 days for completing the field work for the ecological assessment. These timelines, as presented in the current draft Support Sampling Plan, are unnecessarily long. It appears that Solutia intends to complete the required field work in a sequential timeline instead of conducting the various field activities simultaneously as suggested by U.S. EPA at earlier meetings. U.S. EPA has asked the Army Corps of Engineers to put together a proposed schedule (see attached) for completing the required field investigation work. As you can see, using a concurrent work schedule will substantially expedite this phase of the work. Please evaluate the Corps of Engineers' schedule and re-order your schedule accordingly.

Solutia's proposal to submit a Data Report 100 days after all field work and associated data validation and compilation work is completed is also unacceptable. Once the validation is complete, there is no reason a data report could not be submitted to the Agencies within 30 days. Please keep in mind that the Data Report is only a summation of the data, in table-form, with corresponding figures. There should be little need, if any, for a detailed narrative to accompany this report. Please revise your schedule for the submittal of the Data Report to show 30 days following data validation.

Please also revise the schedule to show that the EE/CA Report is to be submitted 60 days after *submittal* of the Data Report, not 60 days after Agency acceptance. The RI/FS Report is also to be submitted 90 days after submittal of the Data Report, not 90 days after Agency acceptance.

VOLUME 1B:

12. Page 2-3, Figure 2-1: There is a potential exposure pathway for the recreational fisher to come into contact with contaminated surface water and sediments. Please revise the Conceptual Site model and Section 5.3.5.

Not Addressed

13. Page 5-1, Section 5.1: In the second paragraph under Section 5.1 consideration should be given to potential residential use near Sites M and N.

VOLUME 1C:

14. Page 5, Section 2.1: It appears that only a check of State Designated Endangered or Threatened Species from the Illinois side of the Mississippi was conducted. Should we also check the list from the Missouri side?

VOLUME 1D:

15. Page 3, Section 1.1: There is a general theme running throughout Volume 1D that appears to be moving the non-time critical removal process into what would more likely be described as a time-critical or emergency removal action. Please note, this will not be acceptable at the Sauget Area 1 Site. Nothing in U.S. EPA's Administrative Order and Scope of Work suggests that a non-time critical removal action for this Site will not comprehensively address all threats. The opposite is in fact true here. Further, nothing in the Administrative Order and Scope of Work suggests that only "short-term" and "acute" threats to human health and the environment will be addressed (Section 3.1 and 4.1). It is critical that Solutia understand that the EE/CA process and the subsequent non-time critical removal action will be completed to address *all* threats to human health and the environment. This has almost always been the case with non-time critical removals at U.S. EPA-Region 5. U.S. EPA will not approve the Support Sampling Plan until this section of the plan is revised accordingly.

Not fully addressed acute

In accordance with the comment above, please replace all references to technologies and treatment processes which have been selectively removed (as originally printed in the AOC/SOW) by Solutia in Section 4.0.

They removed

Also, in Table 1, under the Effectiveness category, it is important to note that the selected removal action for Sauget Area 1 will be the final remedy for the Site. U.S. EPA is not planning to conduct any future "long-term solution" beyond the non-time critical removal and the remedial action for groundwater. Also, under the Implementability category, it should be noted that it is not expected, nor required, that a non-time critical removal be completed within one year.

removed

16. Page 14, Section 4.1.2: The language used in the SOW should be included here.

removed

17. Page 15, Section 4.1.4: The language included in the final paragraph under this section must be deleted. As stated above, the removal action planned for Sauget Area 1 will not be "interim" in nature nor is a remedial action planned to follow the removal (except for groundwater).

VOLUME 1E:

18. Page 17, Section 4.2: The last paragraph on this page is unnecessary. While it might be true that pump and treat systems may require long periods of time to reach cleanup goals for groundwater, the fact still remains that using a pump and treat system is generally very effective in terms of preventing the expansion of plumes (i.e., containment).

VOLUME 2A:

19. Page 43, Section 5.3.3: At the top of the page, please describe where and for how long drummed wastes will be kept on-site.

20. Page 49, Section 5.5.2: What is Solutia's suggestion for determining the location and extent of possible buried drums and tanks if the trenching process is terminated when groundwater is reached and no accommodations are to be made to dewater the trenches?

VOLUME 2C:

21. Page 46, Table 9-1: Please revise telephone number for U.S. EPA (Michael McAteer) to 312/886-4663. The same comment applies to Volume 3, Appendix C, page 5, Table 2-3.

DEPARTMENT OF THE ARMY
OMAHA DISTRICT, CORPS OF ENGINEERS
FORT CROOK AREA
P.O. BOX 13287
OFFUTT AFB, NEBRASKA 68113-0287

REPLY TO
ATTENTION OF

May 14, 1999

Fort Crook Area

Mr. Michael McAteer
US Environmental Protection Agency, Region V
77 West Jackson Blvd
Chicago, IL 60604

Mr. McAteer,

As per your request, we have reviewed and commented on Solutia Inc.'s Sauget Area 1 Plan Documents (except for the QAPP, we will provide comments May 21, 1999), dated April 9, 1999. While our comments are numerous, addressing them will streamline the reiterative nature of the characterization work, and facilitate the subsequent development of the assessments and EECAs. Our comments are provided in the attachments.

If you have any questions or comments, please call me at (402)293-2514.

Sincerely,

ATTACHMENTS

Timothy C Gouger

Timothy P Gouger, PE
Rapid Response Project Engineer

USACE COMMENTS

USACE RAPID RESPONSE COMMENTS
to
SOLUTIA's EE/CA and RI\FS
SUPPORT SAMPLING PLAN and FIELD SAMPLING PLAN
SAUGET AREA 1
VOLUMES 1 & 2
May 13, 1999

VOLUME 1

1. **General Comment, Site History:** The plan provides information on the effluent piping (sewers, storm sewers, and process waste and overflow lines) used to convey storm water, process water, and sewage into dead creek. I infer from the reading, Solutia may have site map(s) showing effluent pipe configurations, including point source discharges into the creek from facilities. These maps would be invaluable for FORENSIC activities and waste characterization understanding. Assuming availability, please include in the plan.

2. **Page 2, Section 1.0.** The Site H description states "no wastes are exposed at the surface." Based upon a site walk in Fall 1998 and Spring 1999, Site H has the highly permeable black ash cinders exposed at the surface in several areas.

3. **Page 10, Section 2.5.2.** The plan describes the operation of Site G from 1952 to 1966, and Site H and I from 1931 to 1957. Further, the plan describes the pumping of groundwater in excess of 35 MGD during peak use in 1962, five years after Site H and I ceased operation and during Site G's operation. Obviously, radical changes in the groundwater regime resulted: drawdown of groundwater 15 feet, gradient changes, etc. These changes would facilitate transport of contamination to the point source extraction wells, which likely are now in upgradient locations but where likely then in downgradient locations. Identifying those facilities pumping groundwater and at what rate on the groundwater maps is useful in understanding limitations of past groundwater characterizations and current plume geometry.

4. **Page 15, Section 2.6.3, Page 18 Section 2.7.** The plan states: "Site I served as a disposal area for contaminated sediments from historic dredgings of Dead Creek Segment A....On several occasions, CS-A was dredged and contaminated sediments were disposed of onto adjacent Site I." Though it is reasonable to expect high levels of contamination in Site I, previous analyses show relatively low levels of contamination when compared to Site G, H, and CS-B. Identifying disposal area(s) within Site I for CS-A dredged waste materials will strengthen the defensibility, or lack thereof, of proposed locations for waste characterization borings, sampling and analyses efforts.

5. **Page 28, Section 3.0.** The plan describes Data Gap Descriptors throughout Section 3. Given the fact the previous E&E, IEPA characterization work will not be used and the upcoming boring, sampling and analyses work will be solely used in the risk assessments (as per conversation with Solutia), change the descriptors to "Characterization" from "Data Gaps."

6. **Page 29, Section 3.2.** Water quality analyses, such as sulfate, sulfite, sulfide, nitrate, nitrite, chloride, total organic carbon, ferrous iron, alkalinity, oxygen reduction potential, total phosphorous, potassium, total kjeldahl nitrogen, ammonia, methane, ethane, ethene, etc are needed to satisfactorily evaluate the viability of natural attenuation.

7. **Page 49, Section 5.2.** The current narrative (Volume 1 and 2) lacks detail for voc sampling procedure. The narrative should describe the screening of split spoons with PID/FID, the excising of "hot spots," and the immediate storage in labeled jars. Modify narrative in SSP and FSP accordingly.

8. **Page 50, Section 5.3.** Planemetry can be a useful tool to estimate volumes as well. The objective is to estimate *reasonable* waste volumes rather than maximum waste volumes.

9. **Page 50, Section 5.3.** How will the trench locations be located on aerial, site maps?

10. **Page 53, Section 5.6.1.** The proposed strategy for evaluating locations of buried drums is understood. However, take caution in placing too much emphasis on the comparison of groundwater concentrations and magnetic anomalies. Again, industrial facilities were pumping groundwater at rates above 35 MGD after most landfills ceased operation. Obviously, significant levels of contamination could now be found several hundred feet, several electromagnetic grids away from actual source areas. This history should be used as well when evaluating potential source areas.

11. **Page 53, Section 5.6.1.** How will Solutia coordinate the magnetometer survey to aerial photographs, existing site maps (use of a benchmark)?

12. **Page 57, Section 6.2.** While we agree domestic well pumping is not likely to change gradient and plume migration, site specific geotechnical considerations (deposition of silt, finer grain sands) is sufficient to change flow direction, migration of the plume. Also, past industrial pumping may have facilitated plume migration in directions previously not considered. The upcoming groundwater characterization, to include the development of a map showing industrial pumping point sources and upgradient sampling may be useful in better understanding the observed southerly vector in Site H plume and better delineating plumes in general.

13. **Page 60, Section 6.5.1.2.** Recommend including a saturated thickness groundwater sampling station immediately upgradient, northwest of residences on Walnut St (see Figure 7)

14. **Page 64, Section 6.5.2.3.** The groundwater sample in Site I should be located where the waste sediments from CS-A were disposed of. Likewise, other groundwater samples should be located in areas of source material as well.

15. **Page 66, Section 6.5.4.2.** Identify the rate of pumping in narrative for time-series sampling.

16. **Page 67, Section 6.5.4.3.** Provide IEPA results for past domestic well sampling in an appendix.

17. **Page 73, Section 7.3.** What about 20% split samples for surface samples too?

18. **Page 76, Section 8.0.** The SSP should state that a sediment sample will be taken from the upstream and downstream side of each culvert, within a specified radial distance from each inlet and outlet.

19. **Page 77, Section 8.1.** Through identification of present and past point source discharges from industry into Dead Creek, a discrete sample taken at the outfall would strengthen forensic efforts and characterization understanding.

20. **Figure 11.** Legend is missing.

VOLUME II

1. **Page 27, Section 5.1.1.** The plan states: "Excavated soil and fill material will be returned to the test trench, with the exception of any intact drums, which will be removed provided confined space entry is not needed to retrieve a drum." The plan does not address the possibility of discovering free product from test trenching or other characterization work. Obviously, removal of free product accelerates mitigation.

2. **Page 43, Section 5.4.1.** See comment number 15, Volume I.

3. **Page 44, Section 5.4.1.** The plan states: "For the purpose of the FSP, we have assumed optimum geologic conditions are present for the identification of drums. Optimum conditions assumes that buried drums are: Present as collections of upright drums and not disoriented single drums; Composed of steel; Have not deteriorated to the extent that they are no longer magnetically susceptible." Assuming optimum conditions for identification of drums appears less than reasonable. It seems more reasonable to assume drums were disposed of indiscriminately, with no concern for "aligning" nor grouping drums in the landfill. Further, "satellite" drums containing free product could be dispersed in the landfills. Also, the drums were buried when the groundwater table was depressed (reportedly 15 feet beyond normal). Now, the water table has recharged, submerging more waste materials, including drums. Thus, the buried drums have had ample opportunity to deteriorate, rust over the last 33 years. Recommend Solutia factor these considerations into interpretation of magnetic anomalies, decisions for trenching, and ultimately, efforts to remove free product.

4. **Page 49, Section 5.5.2.** The plan states: "No accommodations will be made to dewater test trenches or manage groundwater during excavation activities...." While it is agreed minimizing the extraction of groundwater from the excavations is advantageous, how will free product be managed in the event it is uncovered? Obviously, removal of source material is a high priority, though it is not addressed in the plan.

5. **Page 59, Section 5.7.3.** Identify the depth bgs for the sampling intake device or identify the desired sampling point in bgs in the plan.

6. **Page 60, Section 5.7.3.** The plan describes the removal of one well volume and then measuring nephelometric turbidity units. Will the pH, conductivity, and temperature be recorded at the same time?

7. **Page 59, Section 5.7.3.** The sampling procedures state Solutia plans to: "raise the pump to a level just below the surface of the water in the well." Justify the targeted depth of sampling and consider in your response past sampling activities and the fact domestic well screens have been reported from 15 to 25 bgs

8. **Page 68, Section 5.9.4.** Complete well installation, field log borehole, well purging and recovery forms etc. are needed in the document.

9. **Page 83, Section 5.11.1.** The plan states: "Shallow ground water samples will be collected at two sampling stations to evaluate if site-related constituents are migrating from Dead Creek toward these domestic wells (Figure 7)." While reference to Figure 7 is made, no indication for these sampling locations are provided on the Figure.

10. **Page 86, Section 5,12,1.** The plan states: "Time-series samples, as required by USACE, will be collected over a 24-hour period with samples collected at 0, 12, and 24 hrs after the start of pumping in order to stress the saturated zone during sampling and evaluate constituent trends." USACE did not require the time-series sampling. USACE has cautioned and is cautioning the described low flow procedure will not stress the aquifer as a submersible pump could. The greater the ROI, the greater the

confidence the groundwater data is representative, which is especially important when using the data to evaluate hazards associated with the domestic wells.

11. **Page 86, Section 5,12,1.** The plan should describe the anticipated ROI for the low-flow pumping at the described time intervals.

12. **Page 87, Section 5.13.3.** The plan states: "The domestic well samples will be collected from a tap as close as possible to the well head." Because these domestic wells are available for non-consumptive purposes (watering lawn, garden, etc), they likely still have a hydropneumatic tank and associated controls and instrumentation, and a dedicated, outside hose bib. Even if there is a sample port or equivalent off the pump discharge line, taking the sample there creates uncertainties. However, obtaining a groundwater sampling through a decontaminated pump and tubing reduces uncertainty with the sampling. Recommend use of sampling procedure which is independent of existing domestic well system.

13. **Page 88, Section 5.14.** Slug test may provide "gross" estimates for leachate collection systems; but they have very limited value. I appreciate the discussion but am still concerned that if a pump-n-treat remedy, or variation thereof, is chosen to mitigate contaminated groundwater, leachate, etc., the results from the slug tests will be used to plan, design the system. Slug tests have provided limited information in the past simply because they do not satisfactorily stress the aquifer (i.e. operational pumping rates often exceed that provided by slug test, ROI and other hydrogeologic factors can be orders of magnitude off). While the slug tests can provide some information, designing groundwater recovery systems based upon site specific pumping tests is invaluable.

14. **Page 90, Section 5.14.** It is not clear from the reading how the slug tests for the upper fine-grained zone, the middle fine sand zone, and the lower coarse sand zone will be accomplished? Will a new well be drilled with screens (and packers) at these intervals or another approach used? Also, what are the anticipated depths for the slug tests (to match the described geologic zones).

15. **Page 92, Section 5.14.** Responses to the slug test Data Review (E) questions should be included in the field notebook and a form developed for slug test evaluation.

16. **Page 94, Section 5.16.1 and page 55, Section 5.7.1.** The plan describes the use of EE-20, EE-04, and EEG-108 as upgradient groundwater sampling stations. How "in-line" are these wells with the groundwater extraction wells used by industries (Cerro Copper, Monsato, etc.) for process water, cooling water. It would appear, the industrial wells were to the northwest of the landfills, whereas the wells used for upgradient sampling are to the east of the landfills. Recommend providing upgradient, crossgradient sampling locations, based on past point source pumping locations, in the plan.

17. **Page 121, Section 5.23.** The plan states: "Stabilization treatability pilot tests will be conducted to evaluate the appropriate mix of stabilizing agents needed to reduce metals and organics leaching." While stabilization of metals is a US EPA approved best demonstrated available technology, stabilization for organics is not. A secondary benefit from stabilization of metals may be reduced leachability for organics. Modify text accordingly.

Thomason

Volume 1A, Support Sampling Plan

1. **Page 6, Section 2.0** It is noted that Figure 1 does not actually depict Creek Segment F and none of the figures provide a very good representation of this creek segment. A figure showing Creek Segment F alone would aid in understanding the various plans and will certainly be required for the report to be produced by the EE/CA.

2. **Page 84, Section 10.0** Considering the air sampling locations, is this data relevant for validation of modeled residential exposures?

3. **Page 87, Section 11.1** Consider obtaining a soil/sediment sample co-located with the plant sampling location.

4. **Page 89, Section 11.4** Consider the possibility of using two reference areas, since the habitat in Creek Segment F is quite different from that of the other creek segments. In addition, it is noted that Dead Creek contains mostly non-flowing water, which is probably not a good match for Old Prairie duPont Creek.

Volume 1B, Human Health Risk Assessment Workplan

1. **Page 2-3, Figure 2-1** The (d) for Borrow Pit Lake at the top of the indoor industrial worker column appears to be a typo.

(2) **Page 2-3, Figure 2-1** The recreational fisher receptor includes ingestion of fish only. Can you provide a justification that the fisher will not be exposed to sediment or surface water?

(3) **Page 2-3, Figure 2-1** The resident receptor needs to include exposure to surface water and sediment. For residents whose backyards end at the creek, it is improbable to imagine that there is not some exposure to these media.

(4) **Page 3-1, Section 3.1.1** Include alternate fish species to evaluate in the recreational fisher scenario if largemouth bass are not present but other populations of fish which are likely to be eaten by humans are found in the Borrow Pit Lake.

(5) **Pages 5-1 and 5-2, Section 5.1** I realize this issue has been commented on and responded to previously, however I feel it warrants one more look. For the residential and construction worker scenarios, please describe the expected exposure pathways for soil and select your soil sampling depths based on these expected pathways. For example, 0-.5 ft. is a good depth for people simply walking across the soil, while 0-2 ft. may be more appropriate for gardening or landscaping. As your plan states, construction/utility work is assumed to occur up to depths of 12 to 15 ft. bgs. However, none of the planned samples are truly representative of this depth. Although you state that the sampling intervals that are planned (both for the source areas and the residential/ commercial/developed areas) are expected to be more conservative, this point is arguable. Consider what data is necessary in order to produce a realistic evaluation of the risk.

(6) **Page 5-2, Section 5.1** Please note that per RAGS, composite samples can only be used to represent average exposures. I don't believe you will be able to calculate an RME for the construction worker in the source areas.

(7) **Page 5-3, Section 5.3** Suggest adding a trespasser scenario for the source areas. This receptor is the one to which the air sampling data is most applicable. Addition of this scenario will require taking surface samples from these areas.

8. **Page 5-3, Sections 5.3.1 and 5.3.2 and pages 5-16-18, Table 5-2** Please clarify some of the aspects of the indoor industrial worker and construction/utility worker scenarios. For the indoor industrial worker, Table 5-2 indicates that you will model indoor air concentrations of VOCs from two different sets of data. Do you have an indoor industrial worker for the fill area and another for the commercial/undeveloped/developed areas? Likewise, the text in Section 5.3.2 seems to indicate two different construction worker scenarios: one for each source area and another for the residential/commercial/undeveloped areas. However, Table 5-2 indicates 1) modeling of VOCs for outdoor air in the fill area, but also lists inhalation of particulates and volatiles beside the source area waste samples; and 2) modeling of VOCs for outdoor air in the developed/ undeveloped areas and inhalation of particulates and volatiles beside the surface and subsurface samples from these areas. Are the fill area and the source area the same area or different? For these receptors, are you using two sets of data to develop inhalation exposure point concentrations? Please clarify.

9. **Pages 5-16 and 5-17, Table 5-2** Please justify why indoor inhalation exposures are being modeled from groundwater data rather than soil data. For buildings built on a slab, wouldn't use of soil data be more appropriate?

10. **Pages 5-16 thru 5-18, Table 5-2** Can the air sampling data (taken at the surface while the soil is undisturbed) be used to validate/adjust the modeled air concentrations for the construction worker, who will be digging into the site and be exposed to surface and subsurface soils? The two don't really seem comparable.

Volume 3, FSP

1. **Section 4.8.1 and 4.8.2** The number of crayfish to be collected doesn't seem to agree between these two sections. Please clarify the number of crayfish to be collected from each creek segment, from the borrow pit lake, and from the reference area.

The following comments are offered as suggestions to improve safety and maintain compliance with OSHA requirements contained in 29 CFR 1910.120.

Volume 2C, Health and Safety Plan

1. **Page 7, Section 2.1.2** It is stated that Level C PPE will be worn if the trench is entered for observation of the contents of the trench. What cartridge will be used with this respirator? Is there a cartridge available that is protective against the multitude of wastes possibly present in these waste areas? Given the nature of the waste areas where the trenching will occur, entry into these trenches for any reason is strongly discouraged. I am also uncomfortable with Level D protection for observation of the trenching. Level B seems more appropriate for anyone in the vicinity of the trenching.

2. **Page 11, Section 2.4.2** I do not feel Level C PPE is adequate for drilling in the waste areas. The contaminants are unknown and have unknown warning properties, and however carefully the sampling locations are selected, there is a potential for hitting a drum. I suggest Level B for drilling in the waste areas.

3. **Page 15, Section 2.7** The extent of contaminant impact to the domestic wells is unknown. Splash protection and use of field monitoring at a minimum are recommended.

4. **Page 15, Section 2.8** There appears to be a disconnect in information here. The sampling described is that which will occur in the undeveloped and developed areas, however, precautions for working in Area G are described.

5. **Pages 18 and 19, Section 2.11** The description of drum handling procedures is quite minimal; more detail would be helpful.

6. **Page 19, Section 2.11.2** This section discusses entry into trenches for drum removal. The Support Sampling Plan stated that this would not occur. Please change this section to match the Support Sampling Plan.

7. **Page 20, Section 2.11.2** Please note that OSHA excavation regulations are contained in 29 CFR 1926.650-652, not 1926.256.

8. **Pages 24-25, Sections 4.11 thru 4.1.4** Please review the components of the various levels of protection. Level D and Modified D never involve respiratory protection. Level C always includes an air-purifying respirator, not just a face shield and safety glasses.

Volume 3, Appendix C

1. **General** – This health and safety plan seems pretty thin. I didn't see any information on exposure limits associated with expected contaminants, air monitoring or justification for not performing air monitoring, or medical surveillance. Information on decontamination of personnel is sketchy and there is no information on equipment decontamination. Suggest that this plan be beefed up in the areas mentioned above.

2. **Pages 14-18, Section 5.3** This section seems to indicate that all sampling will take place from a boat. The SOPs for collection of crayfish indicate that required equipment includes hip boots or chest waders. Will wading be necessary for collection of samples? If so, it needs to be evaluated in the activity hazard analysis and appropriate decontamination procedures need to be specified.

3. **Page 17, Section 5.3.2** I disagree with the statement that the potential for exposure to biological hazards is low. In addition to the ticks and insects listed in this paragraph, exposure to stinging insects and snakes should be included.

4. **Pages 15-16**, Activity Hazard Analysis – It seems likely that knives or other sharp tools will be necessary during biota collection and processing. If so, include working with sharp tools as a potential hazard.

Beran
Volume 2a, Field Sampling Plan

Note that most comments affect more than one section and/or have corrosponding sections in other documents.

1. **Page 27, Section 5.1**. More details should be given to the drum handling procedures. Include any field characterization and test bulking procedures, etc. The procedures should include provisions of "over-excavating" of any released product and subsequent excavator bucket decontamination.

2. **Page 29, Section 5.1.3.** After returning the waste to the trenches, you may want to at least grossly decontaminate the bucket prior to handling the cover material (also consider using some of the waste material encountered for the pilot tests).

3. **Page 31, Section 5.2.3**. Specify the compound list and detector type to be used (this information could be in the QAPP if preferred).

4. **Page 42, Section 5.3.3.** Equipment Decontamination: You may want to consider having some solvent around incase tarry or other "difficult" wastes are encountered.

5. **Page 42, Section 5.3.3**. Disposal of IDW: The unused "waste" cuttings could be used for the treatability test samples, to help minimize disposal costs.

6. **Page 49 , Section 5.5.2.** See earlier comments regarding trenching activities.

7. **Page 34, Section 5.3.3**. Clarify the text to reflect that the a sample will be collected for every ten foot of waste, not necessarily at ten foot intervals from ground surface.

8. **Page 57, Section 5.7.3.** A set of procedures should be developed for sample locations with NAPL's. Some considerations: The water level probe will need a more vigorous decontamination than a distilled water wash/rinse. Well development should be skipped. If the well is sampled, a disposable bailer (or peristaltic pump if shallow) would be preferable to a down-well pump, and sample container requirements, the appropriate extraction /analysis suite (e.g waste dilution and cleanup). Also, I would recommend shipping product samples separate from the environmental samples.

9. **Page 58, Section 5.7.3**. The test discussing turbidity suggests that the water samples may be filtered. Generally, unfiltered samples are used for risk assessment purposes. If it is desired to have dissolved metals for fate and transport and evaluation of the effect of the turbidity, both filtered and unfiltered should be collected.

10. **Page 58, Section 5.7.3** Quite a few of the ground-water samples are going to be collected from greater depths than the functional depth limit for peristaltic pumps. The Grundfos Redi-Flo2 2" pumps is the smallest down-hole pump that I'm aware of, which would preclude the use of 1-1/4 " drive points (pg. 63 section 5.9)

11. **Page 59, Section 5.7.3**. Many EPA Regions and States discourage (prohibit) the use of a peristaltic pump for volatile organic sampling. If this is a potential issue at this site, the use of positive pressure pumps or bailers should be considered for the volatile organic samples.

12. **Page 100, Section 5.17.5**. Details regarding the implementation of Method 5035 should be given. (e.g. Are EnCore type sample containers going to utilized, or field preservation.)

13. **Page 104, Section 5.19**. I recommend delaying the selection of background samples locations and depths until the "on-site" field is completed, so a background value can be developed for each soil type encountered (which will be evaluated against background). Depending on the level of

development of the background water well locations, the 0-6" sample may comprise of topsoil or gravel or other materials comparatively low in metals and other compounds and may result in identifying more on-site soils as being "above background" than appropriate.

14. **Page 105 Section 5.20,** In areas likely to be impacted, subsurface samples would be useful for volumes calculations and/or confirm that contamination is limited to the surficial sediments.

15. **Page 107 Section 5.20.1**. Unless there is a specific reason for using method 7951 (and presumably 7211 for copper rather than the zinc method 7951), I would strongly recommend using 6010 for the metals. Typically, a much wider calibration is used with the ICP and it has fewer interference problems and according to the Laboratory's QAPP they don't even run 7951.

16. **Page 107, Section 5.20**. On page 105, the objective of this sampling is to support the human health and ecological risk assessments. TPH data, rather than constituent specific analysis (e.g. 8270) is going to be difficult, at best, to evaluate for these purposes. If the data is intended to be used for source identification, you may want to consider doing GC/MS analysis on a portion of the samples to ensure that the compounds detected by the GC/FID are indeed petroleum related and not a "soup" of other organic manufacturing wastes. Also, as the TPH present from past refinery operations is not going to resemble (fingerprint-wise) the "products" normally used as calibration standards by 8015, you may want to consider the API-THP method.

17. **Page 112, Section 5.20.4**. It would be preferable for the sediment sampling taken in conjunction with the biota sampling to be collected at the sample locations and at the same time as the biota samples which need to be collected when and where there is biota to be sampled. To avoid the coordination nightmare of trying to use these samples for both purposes, Solutia may want to consider separating those two efforts. This would lead to some duplication of effort/analysis, but may be beneficial in the long run.

18. **Page 116 Section 5.21.3**. Other than perhaps the volatile sample, I see no reason for sampling the surface water at such a slow rate. I would recommend not specifying a flow rate, and would even give the option of using a dipper, or other sampling device.

19. **Page 117, Section 5.22.1**. I have concerns regarding the analytical reliability of the proposed sampling methodology. The operational parameters of the proposed sampling protocol are so different than the intended and evaluated conditions established for the respective methods, it is not clear that the data generated will be reliable. The methods cited were evaluated as short duration, single sampling period samples, not 24-hour cumulative duration samples collected over 7 days. Some factors contributing to the uncertainty include: sample stability over the course of 7 days at ambient conditions, safe sample volumes at a weeks worth of temperature fluctuations, positioning uncertainties as wind directions change, diffusion effects during a ambient storage (leading to premature breakthrough). Unless Soultia knows of studies demonstrating the analytical reliability of the proposed approach, I strongly recommend sampling for a much shorter period, either during a worst case scenario (a warm dry day), or 7 daily (if a weeks time is needed) individual analysis.

20. **Page 117, Section 5.22.1**. Consider the use of TO17 rather than TO1. It is capable of sampling a wider range of compounds and its built in quality control features make the data considerably more reliable.

21. **Page 117, Section 5.22.1.** TO-13 only monitors PAH's which are not major contaminants at the sites. I am unaware of any established air sampling methods for a full range of semivolatiles. Unless you can identify a method that will sample wider variety of semivolatiles, I recommend that you sample and analyze the surface soils, and only analyze those semivolatiles actually present. The same procedure could be follow for the other contaminants primarily transported as particulates (e.g. PCB's, Dioxins).

22. **General.** A table of required sample preservatives, containers, and holding times should be included.

23. **General.** You may want to specify to the laboratory to use mass spec whenever possible for the second column confirmation in the methods that require it. With the variety of organic waste streams potentially present, the mass spec should help in avoiding mis-identification of "miscellaneous organic crud" as target compounds. Also, unlike "typical" environmental samples contaminated with a limited number of "products", the lab will be analyzing mixtures of many "by-products", and the product "patterns" (such as specific PCB's Aroclors) will not be typical and many are likely to overlap (chromatograhically anyway).

24. **General.** Regarding the PCB analysis, as it is unlikely that "specific" Aroclors will be found, congener specific and total PCB's are more likely to be useful.

WESTON COMMENTS

WESTON'S RISK ASSESSOR'S COMMENTS TO
SOLUTIA'S EE/CA AND RI/FS SUPPORT SAMPLING PLAN, ECOLOGICAL WORK PLAN, FIELD SAMPLING PLAN, AND QAPP
SAUGET AREA 1
VOLUMES 1 AND 3
April 9, 1999

Volume 1A – Support Sampling Plan

1. **General.** Fluorides and phosphates have been identified as chemicals associated with past activities at the site. Since fluorides are highly toxic in the aquatic environment, and phosphates are contributors to nutrient loading and have been found in site sediments in percentage concentrations during previous sampling activities, fluorides, total phosphates, and ortho-phosphates should be analyzed in surface water and sediments.

2. **Page 70, Section 7.0, "Soil Data Gap Sampling Plan", third paragraph; Page 72, Section 7.3 "Extent of Contamination in Developed Area Surface Soil Samples;" and Page 73, Section 7.4 "Extent of Contamination in Developed Area Subsurface Soil Samples."** The descriptions of the sampling strategy are confusing. The SSP states that surficial soil samples will be collected from residences adjacent to the highest detected COC concentrations along the transects (3 collectively from transects 1 to 6 and 2 from transect 7). What chemical(s) is/are being used to determine the highest concentrations? What is to be done if COCs from different chemical classes are highest near different residences? Is the soil sampling going to be extended radially from the point along the transect which shows the "highest" contaminant concentration?

3. **Pages 71 through 72, Section 7.2 "Extent of Contamination in Undeveloped Area Subsurface Soils."** The SSP states that PID or FID readings will be used to identify the most impacted portion of the sample for chemical analysis. This process cannot detect inorganic contamination. What process is in place to ensure that high levels of inorganic contamination are not being overlooked?

4. **Page 76, Section 8.0 "Sediment Data Gap Sampling Plan."** Please specify the depth(s) at which these samples will be collected.

5. **Pages 77 through 79, Sections 8.1, 8.2, and 8.3.** Dioxins/furans are missing from the industry-specific analyte list for sediment coring in the Undeveloped, Developed, and Borrow Pit Lake areas of Dead Creek. Given that MidWest Rubber is known to have burned tires at the site, it seems as though dioxins/furans would be industry-specific chemcials.

6. **Pages 79 through 80, Section 8.4, "Extent of Site-Specific Constituent Migration in Dead Creek,"** Additional samples for characterization should be collected within the creek for analysis if the samples collected every 1000 ft analyzed for TCL/TAL reveal relatively high concentrations of a chemical currently not considered "industry-related." Contingency procedures for this instance should be presented.

7. Why are no air samples being collected from around site N?

8. **Page 86, Section 11.0 "Ecological Assessment Data Gap Sampling Plan", Paragraph 2.** Paragraph indicates that VOCs will not be included in the ecological assessment because they do not bind to sediments and volatilize in the water column. While these statements regarding the fate of VOCs may be true, VOCs cannot be eliminated from the ecological assessment until it has been shown that VOCs are not detected or that the concentrations in the exposure media are not of ecological concern. If VOCs are not detected in sampling results from surface water and sediment, then it would be unnecessary to sample biota for this chemical class.

9. **Page 87, Section 11.2 "Evaluation of Toxicity in Creek Segments B, C, D, and E."** It is not acceptable to base the sampling locations for the ecological risk assessment support sampling on the results of the sediment sampling for migration of industry-specific chemicals (Sections 8.1 through 8.3) if dioxins are not included in the sediment analyte list, particularly since the Preliminary Ecological Risk Assessment for Creek Segment F (the segment farthest away from the source areas) indicates detrimental effects to wildlife from doxins. In addition, what industry-specific chemical is going to be used to determine where the biota samples will be collected; and parallel to the question in comment #1, what will be done if chemicals from different chemical classes are radically different in concentration (e.g., highest detected versus lowest detected) at a sampling location?

10. If habitat for crawfish is present within these creek segments, crawfish sampling should occur at the selected ecological sampling locations.

11. Given the observation of numerous piscivorous birds wading within these creek segments, one is lead to believe that food items must be available within these segments. The field reconnaissance should include a biological survey of Dead Creek, and if fish are present in these segments, some should be collected for chemical analysis.

12. Please indicate the number of benthic community analyses to be performed within each segment.

13. **Page 88, Section 11.3 "Evaluation of Toxicity in Creek Segment F"** Please indicate how the sampling locations between Route 157 and Borrow Pit Lake will be selected.

14. As for creek sectors B through E, if habitat for crawfish is present within the area of Creek Segment F between Route 157 and Borrow Pit Lake, crawfish sampling should occur at the selected ecological sampling locations.

15. Benthic community structure analyses appears to be missing for Creek Segment F between Route 157 and the Borrow Pit Lake. If habitat for macrobenthic communities exist, the community structure should be performed at the three sampling locations within this area.

16. Given the size of the Borrow Pit Lake, the number of biota samples should be increased to ten sampling locations.

17. **Pages 89 through 90, Section 11.4 "Evaluation of Toxicity in the Reference Area."** Chemical analyses for sediment should be performed for samples collected within the reference area.

18. A full suite of chemicals, including VOCs, should be analyzed for for the samples collected within the reference area.

19. Based upon the differences in habitat among creek segments and the Borrow Pit Lake, evaluating two reference locations may be in order (e.g., one in still water, one in flowing water).

20. **General Biota Sampling Comment.** Sediment samples should be collected and analyzed concurrent with the biota sampling so that current conditions at the collection site can be established. Sampling biota without confirming the sediment concentrations hinders risk management decisions.

21. **Page 91, Section 11.7 "Toxicity Testing or Trapping."** Refers to Volume 1C Ecological Risk Assessment Work Plan. The work plan does not contain sufficient information to support this section, the information appears to be in Volume 3. Please refer to correct document.

22. **General** – Throughout the work plan, text appears that indicates that the risk assessment is based upon what is being done in the support sampling plan. Please note that the support sampling plan is supposed to be developed to support a defensible risk assessment, and not vice versa. Please remove any wording indicating that the SSP is the basis of the HHRA.

23. **Section 2.0, "Site Characterization " 1" paragraph under "Conceptual Site Model".** Outdoor air may be a source of exposure from volatilization from groundwater as well as indoor air. This pathway should be considered in the HHRA.

24. **Page 2-3, Figure 2-1.** Soil exposure pathways need to be added for the "recreational teenager".

25. **Page 3-1, Section 3.1.1, second to the last bullet.** If largemouth bass are not present in the Borrow Pit Lake but other game fish are, they should be collected and analyzed for use in the HHRA.

26. **Page 3-1 and 3-2, Section 3.1.1.** Surface water is missing from the list of media of concern.

27. **Page 3-4, Section 3.1.3.7, "Air"** This section indicates that the air sampling is being done to validate and adjust predictive models. According to page 5-12, dust concentrations in ambient air are to be derived following the EPA Soil Screening Guidance (EPA/540/R-95/128). It is inappropriate to compare the measured air concentrations with the modeled concentrations since the measured are being collected as PM 2.5 and the modeled are calculated based on PM 10.

28. **Table 5-1.** The fish exposure pathways should be listed under "Current and Future".

29.

30. Volume 1C – Ecological Risk Assessment Work Plan

31. **General.** A terrestrial component should be considered for evaluation in the ecological risk assessment. (See fourth bullet under Volume 3 - Ecological Sampling FSP and QAPP

32. **General.** Although the SSP indicates that crawfish will be collected, there is no direct reference in the ecological work plan as to how they will be used in the evaluation of ecological risk.

33. **General.** If Site M is capable of supporting aquatic life, it might be prudent to add this area to the biological sampling effort and toxicity. This change would need to be addressed in the SSP and FSP/QAPP as well.

34. **Section 1.** Please include a conceptual site model diagram in future documents.

35. **Page 12, "Comparison to Background."** Only inorganics may be eliminated by comparisons to background.

36. **Page 14, "Warm Water Fish Species."** Bottom feeding fish (e.g., bullhead) should be included in the species of concern since they have intimate contact with potentially contaminated sediments.

37. **Page 19, Table 1.** This table lists the "field assessment of benthic macroinvertebrate community structure" as a measurement endpoint. Please reference where the protocol for the community structure analyses is found.

38. **Page 19, Table 1, Measurement Endpoints 2b and 2e.** Since SVOCs, pesticides, herbicides, PCBs, Dioxins/furans, and inorganics are being analyzed for within the media (aquatic plants and macroinvertebrates), it is not sufficient to consider only metals and PAHs for the evaluation of exposure via food chains for mallard and muskrat. Please modify to indicate that all COECs will be considered.

39. **Page 19, Table 1, Measurement Endpoint 2d.** Based on the ecological and land use descriptions, the occurrence of otter within the Dead Creek drainage is questionable. An alternate receptor should be proposed, and used in the instance that historical observations and/or site reconnaissance do not suggest the presence of otter.

40. **Page 24.** The ecological work plan indicates that for the evaluation of herbivorous receptors, fruit, leaves, and roots of aquatic plants will be collected. There are inconsistencies between the SSP (pages 87 through 90), the QAPP/FSP (page 12), and the work plan. Because of these inconsistencies, it is unclear how many of what plant parts are to be sampled where. (Note that there is no Table 4-1 in my document, which may have helped elucidate.) Please clarify the plant tissue sampling and make consistent throughout the three documents.

41. **Page 26, Concentrations of COEC in food and sediment.** For clarification, the exposure point concentration used to determine chronic effects should be the lower of either the upper 95% confidence limit or the maximum detected concentration (U.S. EPA, 1992. *Calculating the Concentration Term*), not the arithmetic mean.

42. **Page 26.** Contamination present in bank soils/sediment and possibly in soils adjacent to the creek, not just sediments collected within shallow water in open areas of Dead Creek should be used to assess incidental sediment/soil ingestion for receptors such as the muskrat and the otter.

43. **Page 26.** Although one can suggest that the exposure to COECs associated with surface water ingestion will be lower than the exposures from the diet and sediment ingestion, it is merely conjecture at this point. Concentrations of the COECs in the surface water must be available before writing off this pathway. Even if exposure from the surface water pathway may not be as great as from the other ingestion pathways, it still contributes to overall risk.

44. **Site Pictures.** While the effort to include a photolog is appreciated, the photo reproduction is of such poor quality that the photos lend nothing to the report. If a photolog is to be included in the future, please use a high quality color copier to reproduce the pictures.

Volume 3 – Ecological Sampling FSP and QAPP

45. **General.** Tissue analytes should not be different from the soil/sediment/water analytes within a chemical class. Please provide a rationale for the difference or make the analyte lists consistent.

46. **General.** Tables should be provided that present ecological benchmarks and the analytical reporting limits so it is easily determined for which chemicals reporting limits are too high and need to have modified methods considered.

47. **General.** Please present how sampling locations for the sediment triad analyses are to be selected.

48. **Section 4, Page 1 of 17, Paragraph 1.** This paragraph indicates that the land bordering Dead Creek and the wetland environments is developed for residential and/or commercial use, the assessment does not include a terrestrial ecological risk assessment. This is not an acceptable justification for eliminating a terrestrial component. These types of land uses can support vegetation and invertebrates, and most likely small mammals and birds. If analytical results yield detected concentrations of contaminants in the soil, in particular if they are bioaccumulative contaminants, the terrestrial component should be examined. In addition, exposure to soil in these areas is being considered for the human health risk assessment and therefore it is assumed that groundwater contamination may be transported to the soils over the stream bank.

49. **Page 2 of 12, Section 1.3 "Project Objectives and Scope," bullets.** Please include crawfish sampling as a separate bullet.

50. **Tables 1-1 through 1-6.** Please indicate what analyses are to be done and what the reporting limits are for crawfish.

51. **Table 1-1.** Table does not indicate that SVOCs are to be analyzed in vegetation and fish tissue. SVOCs should be analyzed in these tissues. This omission from the table also makes the QAPP/FSP inconsistent with the SSP.

52. **Table 1-5.** Assuming that ppt equals parts per trillion. Please advise if this is incorrect.

53. **Section 4.2.1, Page 3 of 17, "Reconnaissance Survey."** This survey should also include a biological survey within Creek Segments B through F.

54. **Section 4.2.1, Page 4 of 17, Bullet #2.** Text indicates that the reference area will provide a basis for comparison with Dead Creek fish tissue samples. The reference area should be able to provide a comparison for all of the matrices, as well as toxicity tests and benthic community surveys.

55. **Section 4.2.1, Page 4 of 17, Bullet #3.** This bullet references Figure 4-1. Neither the USACE or Weston copies have this table. Please provide.

56. This bullet indicates that habitat assessments of 4 sediment triad stations in Creek Sectors B through F will be conducted. According to pages 87 through 89 of the SSP, sediment bioassay samples are being collected from 3 locations from each sector for Creek Sectors B through E, and at each of the three sampling locations in the Borrow Pit Lake. In addition, it is stated in the SSP that the sediment bioassay sample locations in Sectors B through E will be based on the low, average, and maximum detected concentrations from the sediment sampling from migration of industry specific chemicals and that the locations for the Borrow Pit Lake will be selected based on discharge of Dead Creek into the lake. Please determine how many sediment triad stations will be in each creek sector, how the sampling stations will be selected, and make the information consistent between the SSP and FSP consistent.

57. **Section 4.2.2, Page 6 of 17, Bullet #2.** This bullet indicates that bottom-feeding fish fillets will be analyzed. In the SSP (pages 89 and 90), it is indicated that the bottom-feeders analysis will be whole body. Please determine the use of the bottom-feeder fish tissue data and the subsequent appropriate sample type (e.g., whole body, fillet, offal), and rectify the discrepancies between the reports. Note that depending on the size of the fish, the bottom-feeding fish would be an appropriate dietary item for both human health and ecological receptors; and therefore, may need to be analyzed as both fillet and offal samples.

58. **Section 4.4, Page 7 of 17.** Please explain the difference between the minimum sample amounts needed for fish and benthic organisms and vegetation. If the parameter list is the same, and the weight needed for each parameter does not differ among tissue types, then the minimum sample amounts should all be the same.

59. **Section 4.4.1, Page 8 of 17, Paragraph 1.** The "SOP for the Collection of Benthic Macroinvertebrates using Kick Net" referred to here is missing from Appendix B.

60. **Section 4.4.1.2, Page 8 of 17, Paragraph 2.** The text states that if possible, sampling at each of the locations will focus on the collection of larger benthic organisms (e.g., clams or dragonfly larvae). What is the intended use of clam data in the ecological risk assessments? In addition, bivalve data should not be composited with insect larvae.

61. **Section 4.4.1.2, Page 9 of 17, Paragraphs 1 and 2.** Paragraph 1 indicates that one benthic organism tissue sample will be collected per creek sector. As per previous conversations, assuming the biomass is available, three samples per sector were to be analyzed. In addition, the text (in paragraphs 1and 2) is inconsistent with the SSP, in which three samples per sector in B through E, segment F between route 157 and the borrow pit lake, the borrow pit lake, and the reference area are indicated (pages 87 through 90).

62. **Section 4.7.1.1, Page 13 of 17, Paragraph 1.** The "Fish Log" referred to here is found as Figure 5-2, not in Appendix B. Please correct.

63. **Section 4.7.2.2, Page 15 of 17.** The number of composite forage fish samples should be presented.

64. **Section 4.8, Page 16 of 17.** Paragraph indicates that crawfish sampling is to evaluate bioaccumulation of target analytes and potential subsequent transfer to predatory mammals, such as raccoons. According to the work plan and SSP, raccoons are not a target receptor. Please revise.

65. **Section 4.8.1, Page 16 of 17.** Same comment as previous.

66. **Section 8.2**: Please add organics to the analytes list for laboratory duplicates. Analyzing only inorganics in a laboratory duplicate is insufficient.

67. **General comment regarding fish tissue preparation duplicate samples**. Please include the belly flaps with fillet samples. Fillet sample duplicate or matrix spikes should use the right fillet as the primary and the left fillet as the duplicate sample. Also, realize that there are some problems associated with homogenizing and/or filleting samples in the laboratory when taking split samples. If splits are taken then prepared in the lab, then there is no distinguishing between variation due to preparation and due to analysis. It is recommended that the split samples for all biota are prepared in the field.

USACE RAPID RESPONSE
SAUGET AREA 1
ESTIMATED TIMELINE FOR CHARACTERIZATION WORK

SEQUENTIAL WORK ORDER

Characterization Tasks	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	COMMENTS
Waste Characterization	→														8 Calendar Weeks
Groundwater Characterization				→											11 Calendar Weeks
Dead Creek Sampling					→										9 Calendar Weeks
Air Sampling							→								1 5 Calendar Weeks
Ecological Sample Collection								→							2 5 Calendar Weeks
Pilot Testing									→						4 months
Data Collection Document Due												→			1 5 months

CONCURRENT WORK ORDER

Characterization Tasks	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14	COMMENTS
Waste Characterization	→														8 Calendar Weeks
Groundwater Characterization	→														11 Calendar Weeks
Dead Creek Sampling	→														9 Calendar Weeks
Air Sampling	→														1.5 Calendar Weeks
Ecological Sample Collection			→												2 5 Calendar Weeks
Pilot Testing			→			→									4 months
Data Collection Document Due					→	→									1.5 months

USACE RAPID RESPONSE
SAUGET AREA 1
ESTIMINATED CHARACTERIZATION SCHEDULE
May 24, 1999

CHARACTERIZATION TASKS, DESCRIPTION	# SAMPLES	ESTIMATED TIME Work Days
Waste Characterization		
Waste Depth Sampling, G, H, I, L, & N. 4 borings per site to 40 ft	20	5 days
Sediment Samples Site M	4	0 5 day
Well Installation Site G, I 10 Ft TD	NA	0 5 day
Boundary Trenching G,H,I,L,N; 4 trenches per site,	20	3 days
Soil Gas Survey G,H,I,L,N 1sample/acre	20	10 days
Additional SGS	60	
Electromagnetic Survey G,H,I,L,N 50 x 50 grid	468	15 days
Test Trenches G,H,I,L,N. 1 trench per site	5	5 days
	Waste Characterization Time:	39 Work Days 8 calendar weeks

USACE RAPID RESPONSE
SAUGET AREA 1
ESTIMINATED CHARACTERIZATION SCHEDULE
May 24, 1999

CHARACTERIZATION TASKS, DESCRIPTION	# SAMPLES	ESTIMATED TIME Work Days
Dead Creek Sampling		
Transects (7) Soil Sampling undeveloped areas 1 sample\200 ft Surface, subsurface samples	90	5 days (20 samples/day)
3 samples closest to highest [ ] along transects	3	0.5 day
Soil Sampling, developed areas. Surface, subsurface samples	40	2 days (20 samples/day)
2 samples closest to highest [ ] along transects	2	0.5 day
Background Soil Samples EE-20, EE-04, EEG-108, 3 depths	6	1 day
Leachate Sampling Site I, G	2	1 day
Dead Creek Sediment Sampling		
Undeveloped Areas, 1 sample\200 ft	50 (150)	15 days (10 sediment samples/day)
Developed Areas, 1 sample\150 ft	47 (141)	14 days
Borrow Pit Lake	8	2 days
TAL\TCL sampling every 1000 ft	20	Take samples when developed, undeveloped areas are sampled
Surface Water Sampling		
Dead Creek, 1 sample\1000ft CS-F Old Prairie du Pont (upstream & downstream)	20 for all descriptors	5 days
	Waste Characterization Time:	46 days 9 calendar weeks

USACE RAPID RESPONSE
SAUGET AREA 1
ESTIMINATED CHARACTERIZATION SCHEDULE
May 24, 1999

CHARACTERIZATION TASKS, DESCRIPTION	**# SAMPLES**	**ESTIMATED TIME Work Days**
Air Sampling 7 day period VOC T01 SemiVOC, PCB, DIOXIN METALs	 13 13 13	 8 days
Ecological Sample Collection Section 11		10 days
	Waste Characterization Time:	18 days 4 calendar weeks
Pilot Treatability Tests Off-site Waste Incineration On-site Waste Thermal Desorption On-Site Sediment Thermal Desorption Sediment Stabilization Leachate Treatment		3 months to coordinate, execute pilot tests and evaluate results.
	Pilot Testing Time:	3 months

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19 May 1999

Mr. Tim Gouger
U.S. Army Corp of Engineers
Third Floor – Building 525
Offutt Airforce Base, Nebraska 68113

Subject: Ecological Risk Assessment - QAPP/ FSP
Sauget Area 1 Support Sampling Plan – QAPP/FSP
Sauget and Cahokia, Illinois

Dear Mr. Gouger:

Roy F. Weston, Inc. (WESTON®) has completed its review of the Ecological Risk Assessment and Sauget Area 1 Support Sampling Plan QAPP and FSPs for the Sauget and Cahokia, Illinois site. The Ecological Risk Assessment QAPP/FSP was issued by Menzie-Cura and Associates Inc., on 9 April February 1999. The Sauget Area 1 Support Sampling Plan was issued by O'Brien and Gere Engineers, Inc., on 9 April 1999. This letter details the comments that were generated during the review.

Ecological Risk Assessment QAPP/FSP
Menzie-Cura and Associates Inc.

Title Page: Personnel and their corresponding titles must be indicated on the title page. A space for date reviewed by each individual also needs to be added.

Distribution List: A complete list of QAPP recipients is missing. This should be inserted after the table of contents.

List of Acronyms/Abbreviations: This list is incomplete. Please include all acronyms/ abbreviations from the entire document.

Section 1.1 Site History and Background Information: This section refers to segments or sites A through F and G through N identified on Figure 1-1. Is CS-A through CS-E the same as A through E? The following sites or segments could not be identified on this figure: F, I, and J. The figure should be updated to reflect all referenced sites/segments.

Section 1.3 Project Objectives and Scope: It is stated that the sediment toxicity tests will be conducted according to accepted EPA protocols. This statement is vague. Please clarify which specific EPA protocols will be followed.

Section 1.3 Project Objectives and Scope, page 2-12/13: The text indicates a hierarchy for sample analysis. However, the hierarchy is missing for the semi-volatile analysis. Please clarify.

Section 1.6 Data Quality Objectives: The DQO section does not provide the information required in the May 1996 Model QAPP. DQOs should be based on the seven-step process outlined in EPA Document EPA QA/G-4 (September 1994). All seven steps (State the Problem, Identify the Decision, Identify Inputs to the Decision, Define the Study Boundaries, Develop a Decision Rule, Specify the Limits on Decision Errors, and Optimize the Design for Obtaining the Data) must be identified in this section of the QAPP. Also, the reference for the National Functional Guidelines for Organic Data Review is outdated. The correct reference is February 1994.

Section 1.7 Project Schedule: The project schedule is identified as located in Section 16.0 of the Support Sampling Plan. The project schedule could not be identified. Please clarify where the schedule can be found.

Table 1-1 through 1-6: The footnote to the tables suggests that the laboratory will report down to their MDLs and that some of the laboratory MDLs may exceed the ecological reporting limits. All of these tables should be revised to include a column for current laboratory MDLs, expected reporting limits by matrix (biota and aqueous reporting limits may be different), and another two columns for Ecological (Region 5 uses the term Ecological Data Quality Levels {EDQLs) and Human Health Risk Data Quality Limits. These columns are necessary to ensure that the suggested reporting limits and analytical methods can achieve the overall goals of both the Ecological and Human Health assessments. Also, additional footnotes should be added to these tables or text needs to be inserted that explains more precisely how the reporting limits were determined. Why is there no information supplied for percent lipids?

Section 2.0 Remedial Project Manager: The U.S. EPA Remedial Project Manager (RPM) needs to be identified in the text. The RPM must also be identified in Figure 2-1.

Section 2.0 Site Program Manager: Mr. Bruce Yare is identified as the Site Program Manager. However, in Figure 2-1, he is identified as the Technical Manager. All titles and personnel must be consistent throughout the text and on all corresponding tables or figures. Please revise for consistency.

Section 2.0: Is there a project manager for the Illinois Environmental Protection Agency? If applicable, an IEPA Project Manager should be identified in the text along with the U.S. EPA Quality Assurance Reviewer. At a minimum, a laboratory project manager or director and a laboratory quality assurance officer for each laboratory, needs to be identified.

Figure 2-1Project Organization Chart: This figure is inconsistent with the titles and personnel described in Section 2.0. Dean Palmer, Lisa Bradley, John Loper, and Mike Light are not

identified in the corresponding text. Several of the personnel have titles inconsistent with the text. The U.S. EPA Remedial Project Manager, Illinois Environmental Protection Agency Project Manager, U.S. EPA Quality Assurance Reviewer, Savannah Laboratory Quality Assurance Manager, and Triangle Labs Quality Assurance Manager are not identified in the figure. Please revise the figure and all text for consistency. Also, this figure needs to identify lines of communication as well as lines of authority.

Section 3.1.1 Field Blanks: Higher grade water such as high performance liquid chromatograph (HPLC) or ultra-pure water should be used for field blanks as opposed to distilled water.

Section 3.1.3 Laboratory or Matrix Duplicates and Section 3.1.4 Matrix Spike and Matrix Spike Duplicates: Both of these sections refer to matrix spikes; however, the information provided in each section is different. Should one of these sections be addressing field duplicates as indicated in Section 3.1 Level of Quality Control Effort? These two sections need to be revised for clarity.

Section 3.3.2 Laboratory Accuracy Objectives: Which table is Table 3.X?

Table 3-1 SVOCs: It appears that N-nitroso-di-n-propylamine has extended on to two lines. This shifts the MS/MSD precision values one line. The table needs to be realigned to correct this. The field duplicate precision of 50 seems large. The National Functional Guidelines for Organic Data does not support qualification for field duplicates. However, the Inorganic Guidelines use 35. The value of 50 percent should be reevaluated. What is the corrective action if this RPD is not met? Footnote b refers to OLMO3.1. This is an old reference. The most current OLM statement of work is OLMO4.0. However, all laboratories may not have this method in place. The table should be revised based on the latest SOW (either OLM03.2 or OLM04.0). Why does the MS/MSD accuracy have an a footnote as opposed to a b? Internal standard accuracy should also be indicated. Please review and revise as appropriate.

Tables 3-1 through 3-6: The RPD value of 50% (most parameters) seems elevated. This value needs to be further explained. These tables indicate DQOs for biota samples what about the aqueous samples? Internal standard control limits need to be added to the semi-volatile table. Typically SW-846 methods used lab-based statistically complied control numbers. Verify that the laboratory can meet the OLM control limits indicated in these tables. Also, compare these values to the EE/CA and RI/FS Support Sampling Plan Volume 4 Data Validation Plan or discuss with Environmental Standards to ensure that the control limits projected will not produce unwarranted data qualifiers.

Table 3-7: The corrective action table needs to be further defined. For example, the field duplicate RPD is not always identified in Tables3-1 through 3-6 as 50% (see dioxin). This needs to be revised for consistency. Most of the corrective actions suggest qualifying the data. The qualification criteria and the qualifier should be indicated for each QC parameter. The MS/MSD

corrective action suggests qualification if the LCS/SRM results are acceptable. What is the corrective action if the LCS or SRM is not acceptable? Initial and continuing calibration criteria and corrective action should be included in the table.

Section 4.2.1 Reconnaissance Survey, third bullet: This bullet discusses collecting samples in an area comparable to that in the Dead Creek watershed in order to provide a basis for comparison with the Dead Creek fish tissue samples. What about comparisons for the crayfish, benthic organisms, and vegetation samples?

Section 4.2.2 Main Sampling Event: An overall table indicating the total number of investigative and QC samples has not been provided. It is understood that final sampling locations as well as a final number of samples will be determined during the reconnaissance survey. However, most of the sections indicate the total number samples anticipated. A table detailing location of sample (creek segment F), type of sample (benthic organism, crayfish), method of collection (grab, composite, community), analysis required by parameter (SVOC), and total # of QC samples (blanks) needs to be included. Once the final sampling locations are determined, a figure detailing these locations needs to be submitted.

Section 4.4 Biota Sample Collection: Why is there is less grams (130) needed for the fish tissue compared to 150 grams for the benthic organisms and vegetation samples? The breakdown by parameter does not indicate how less fish tissue will be allocated? Please clarify and revise for consistency throughout the text.

Section 4.4 Biota Sample Collection, last paragraph: Why is it necessary to collect the field QC in triplicate? How will triplicate volume be used for field duplicate samples? Please explain the intention of this additional volume?

Section 4.4.2.3 Sample Documentation: What purpose does the tongue depressor and the stain provide?

Section 4.4.3 Laboratory Processing of Benthic Macroinvertebrate Samples: There are multiple approaches suggested for community composition. How will it be determined which approach will be used or will all approaches be used for each community composition?

Section 4.7.1.1 Sampling Protocols: This section describes the fish sampling protocols. In the last paragraph, the text refers back to Tables 1.1 to 1.6 for target analytes for fish. However, in Table 1.1 (Semi-volatiles), the column for *To Be Analyzed in Vegetation and Fish* is not marked. Please revise text and tables for consistency throughout the document. Also, the second paragraph discusses preserving and archiving any grossly deformed specimens? What are the procedures for archiving these samples? Will these be stored at the laboratory or some alternate location? What sample containers will be used?

Section 4.7.1.2 Collection Locations, Target Fish, and Number of Samples: It is stated that fish will only be collected from Creek Sector F and not from Creek Sectors B through E due to intermittent stream flow, and limited habitat. However, if it is determined during the reconnaissance survey that this area is used for recreational fishing or that a more extensive habitat exists, samples should then be considered for these segments.

Section 4.7.2.2 Collection Locations, Target Fish, and Number of Samples: The number of composite forage fish is missing, please provide.

Section 4.8.2 Collection Locations and Number of Samples: Why are there no crayfish projected for Creek Sectors B through E? Benthic organisms and vegetation samples are projected from these areas.

Table 4-2 Sample Preservation, Container Specification, and Holding Time Requirements in Support of the Ecological Assessment: The term biota is inconsistent with the text that describes sediment toxicity bioassay samples, benthic organisms, benthic community samples, vegetation, fish, and crayfish samples. The text for fish and crayfish indicates that samples will be collected in zip-lock bags and placed on dry ice. The text for benthic organisms indicates placing samples into a liter plastic container preserved with 70% denatured alcohol. These issues are not reflected in the table. The cyanide holding time for biota samples should be 14 days not 28. There is no sample container volume associated with the metals and cyanide aqueous samples. Sediment toxicity bioassay samples are not addressed in the table. Please revise the text and table as appropriate for consistency.

Section 5.1.1 Field Procedures, b: This states that all sample labels will include the sample identification number, location, date of collection, time of collection, and type of analysis required. None of the sample documentation sections in section 4 indicated that the type of analysis would be placed on the sample label. Please ensure that this information is added to those corresponding sections and to all sample labels.

Figure 5-4 Example of a Sample Identification Label: This label has terms that are inconsistent with previous text. Previously, the terms sample identification number, sample location, type of analysis, and initials of the collector were used (in section 4 and 5). However this figure also indicates the terms species name or code, total length or size, sampling site, and specimen number. The figure and/or text needs to be revised for consistency and ease of use.

Section 6.1 Field Instrument/Equipment: The reference to another report for calibration procedures is acceptable. However, it is preferred that at a minimum, a list of field equipment be supplied in this section.

Section 6.2 Laboratory Instruments: Laboratory documents that contain calibration information must be referenced and provided as an appendix or other attachment. All analytical methods must be covered and all analytical instruments (including any laboratory instruments used for fish compositing) must be covered in a referenced SOP or discussed in this section.

Section 7.2.2 Biota Methods, second bullet: Will sample homogenization be performed in the field or by the laboratory? A SOP detailing sample homogenization must be referenced and included with this document.

Section 7.2.2 Biota Methods, third bullet: Methods anticipated to be utilized for sample cleanup must be documented in Table 7-1 and corresponding laboratory SOPs must be documented and provided.

Section 7.2.2 Biota Methods, last paragraph: Due to the nature of the samples (tissue, organisms, etc), it is anticipated that the SW-846 methods have been modified by the laboratory in order to meet the needs of this project. The entire SW-846, 3rd edition does not have to be provided with this document. However, any laboratory modifications must be submitted. Any method changes to lower detection limits must be submitted and the most recent MDL studies for each of the analytical methods must be submitted to ensure that the laboratory can meet the projected detection limits previously set forth in this document. The above mentioned documents must also be submitted for the dioxin analytical work that is being subcontracted to Triangle Laboratory. Finally, is percent lipids actually being determined by SW-846 Method 8290 or an alternate method?

Section 8.1 Field Measurements: Please provide the correct reference for the type and frequency of field-generated QC samples (currently referenced as XXX). Equipment rinsate blanks are listed in this paragraph but are not referenced in Section 3.1Level of Quality Control Effort or Table 3-7 Summary of QC Sample Types, Criteria and Corrective Action. If equipment rinsate blanks are to be collected, add this information to the above referenced sections. Also, trip blanks were previously stated as not being necessary due to no volatile organic analysis. Please delete trip blanks from this section.

Section 8.2.5 Laboratory Control Samples and Standard Reference Material: Due to the nature of the samples, an LCS sample will need to be analyzed in conjunction with the aqueous samples and a SRM sample in conjunction with the biota samples (fish, crayfish, benthic organisms, and vegetation).

Section 9.2.2 Procedures Used to Validate Laboratory Data: The reference for Organic Data Review is incorrect. The correct reference for use is U.S. EPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (February 1994).

Section 9.3.2 Laboratory Data Reporting: Will the results of tentatively identified compounds (TICs) be provided?

Section 10.3 Laboratory Audits: Did Menzie-Cura and Associates review performance evaluation sample results that Savannah routinely participates in? Does Savannah participate in and evaluate PE samples for all parameters and applicable methods that will be analyzed for this project? Did Menzie-Cura and Associates review internal and external laboratory audit reports for the Savannah facility conducting the work? Did Menzie-Cura and Associates conduct an onsite audit? Have Savannah MDL studies applicable to this project been reviewed? Was any of the above information reviewed for the work that will be subcontracted to Triangle Laboratory?

Section 11.0 Preventative Maintenance: Were preventative maintenance procedures reviewed for the dioxin samples being subcontracted to Triangle Laboratory? A figure or table (as outlined in the Model QAPP Guidance) should be included detailing each laboratories preventative maintenance procedures and frequency.

Section 14.0 Quality Assurance Reports to Management: The frequency of QA reports and individuals receiving/reviewing QA reports needs to be inserted in this section.

Other: It is not a QAPP requirement, yet it is suggested that a references section be added to the end of the document detailing all of the documents referenced throughout the text.

Appendix A Sediment Bioassay Protocols and Procedures and Appendix B Ecological Assessment Field Sampling SOPs: Both of these appendices need individual table of contents identifying the documents and/or SOPs contained within.

Standard Operating –Collection of Crayfish Using Traps: Section 3.0 indicates placing samples in glass jars or wrapped in aluminum foil and placed in a freezer. This is inconsistent with QAPP text that indicates ziplock bags and dry ice. Revise for consistency with QAPP.

Standard Operating Procedure for Fish Collection and Processing: Section 4.0 indicates a minimum sample weight of 150 grams. This is inconsistent with QAPP text in sections 4 and 5. All procedures, references, weights, etc must be consistent throughout tables, text, attachments and appendices. Please revise for consistency throughout the document.

Standard Operating Procedures – General Comment: All SOPs, field or laboratory, must be consistent with text, figures, and tables in the QAPP and associated sampling plans. Ensure that all documents are consistent.

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List of Recipients: Elizabeth Beauchamp is listed as the Savannah Labs QAO officer. However, in section 2.5.1, Kirstin McCracken is listed as the QAO officer. Please revise for consistency throughout the document.

List of Acronyms/Abbreviations: This list is incomplete. Please include all acronyms/ abbreviations from the entire document. For example, DQL, PQL, ppb, FSP, TPH, and SSP are missing.

Section 1.5.2 Data Quality Objectives and Criteria For Measurement Data: The DQO section does not provide the information required in the May 1996 Model QAPP. DQOs should be based on the seven-step process outlined in EPA Document EPA QA/G-4 (September 1994). All seven steps (State the Problem, Identify the Decision, Identify Inputs to the Decision, Define the Study Boundaries, Develop a Decision Rule, Specify the Limits on Decision Errors, and Optimize the Design for Obtaining the Data) must be identified in this section of the QAPP.

Section 2.1 Project Organization: According to the Model QAPP Guidance (May 1996), an organizational chart should be provided. The chart is to include the lines of communication among all project participants as well as the lines of authority. This chart should include all project participants detailed in the project organization section of the QAPP as well as any other individuals identified in elsewhere in the QAPP or FSP. Also, if there is an Illinois Environmental Protection Agency contact for this site, they should be included in the text and figure as well.

Section 3.7 Level of Quality Control Effort – field blanks: The level of effort for field (equipment) blanks is indicated as one per sampling event. Field blanks should be collected at a rate of 1 per 10 samples, per matrix. Water for equipment blanks should be organic and inorganic-free because field blanks are collected for all organic and inorganic parameters. Higher grade water such as high performance liquid chromatograph (HPLC) or ultra-pure water should be used for field blanks. Also, this paragraph indicates that field blanks will be submitted with investigative samples. Does this include the soil gas and air samples? Please clarify.

Section 3.7 Level of Quality Control Effort – MS/MSD: The term MS/MSD is used for organic samples. The term corresponding to inorganic samples is spike duplicate. Please include language for inorganic spike samples.

Section 3.7 Level of Quality Control Effort – field equipment calibration: The text states that field instrument calibration will occur prior to each day. It is suggested that calibration occur

prior to the start of each day and in the middle of the day (approximately every four hours) for all field equipment including air monitoring equipment.

Section 3.7 Level of Quality Control Effort – accuracy and precision: pH buffers, conductivity standards and calibration gases should be provided in duplicate, from different lots. The accuracy (different lots) of these measurements should be conducted as well as precision (replicate measurements) on the same buffer or standard.

Section 4 Sample Procedures: The background soil sample is labeled BS-EE20-__FT. EE20 is identified as a well identification number. Is this designating a background soil sample collected from a monitoring well that is being installed?

Section 5.1 Field Custody Procedures: Please provide an example sample tag, sample label, and custody seal. A minimum of two custody seals should be applied to all coolers. If there are numbers on the seals, they should be written on the chain of custody form prior to sealing the cooler.

Section 9.3.2 Laboratory Data Reporting: Will the results of tentatively identified compounds (TICs) be provided?

Table 2 Analytical Methods for Parameters: There are two entries for groundwater/surface water and soil/sediment/waste for dioxin and dibenzofuran analysis. The analytical methods listed include Method 8290 and 8280A. Please clarify which method will be used for which matrix and if both methods will be used, justify the differences and benefits of each method.

Table 3 Field Sampling Summary: Groundwater/surface water VOC samples need to be preserved with HCl to a pH<2. The following parameters are missing from the table: ignitability, corrosivity, reactivity, grain size, and pilot test sampling. Does the number of environmental samples include the QC samples or is it only the total number of investigative samples? Please clarify for all parameters.

Tables 5A through 5P Detection Limits: Somewhere on each table the date of the MDL study needs to be indicated. It is unclear if the MDL studies were run in the last year. It is suggested that the table be expanded to include the list of clean up criteria detection limits that will be used to compare the results against for each matrix such as Maximum Contaminant Levels (MCLs) for water or PRGs etc. This will help to determine if the analytical methods and suggested PQLs will meet the overall project and data quality objective goals. Also, it appears that the tables are missing information for the following parameters: ignitability, corrosivity, reactivity, grain size, pilot test sampling and PQLs for all TCLP parameters. If the PQLs for the TCLP parameters are the same as the original analysis (i.e. TCLP VOCs versus VOCs), this needs to be stated on each applicable table.

Tables 6A through 6N: Table 6A and 6B need accuracy and precision limits for cyanide.

Tables 7A through 7H QC Requirements and Corrective Actions: All of the tables should be revised to indicate the data qualification required for correction action. For example, all samples analyzed outside (past) holding times will be flagged with a J qualifier, indicating an estimated value. Also, if the National Functional Guidelines for Organic and Inorganic Data are being used for data validation, the control limits, RPDs, corrective action, etc. should be reviewed to ensure that there are no conflicts between the guidance and these tables.

Table 8 Preventative Maintenance for field and analytical instrumentation: This table needs to include preventative maintenance for both laboratories (Savannah and Triangle), all instruments, and all field instruments (pH, conductivity meter, turbidity, etc). If this is not feasible, please indicate alternate locations where preventative maintenance can be found.

Figure 1 Example Chain of Custody: The chain of custody form needs to be revised so that sample preservation can be entered on the form.

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Section 5.1.3 Field Procedures: Will the person overseeing the work be a "competent person"? What types of shoring will be used during the trenching process to ensure worker, operator, and bystander safety?

Section 5.3.2 Waste Sampling Rationale/design: The second paragraph states that composited waste samples will be analyzed for waste disposal characteristics (VOCs, SVOCs, etc). Does waste disposal characteristics indicate TCLP analysis for these parameters? In the QAPP, Table 1, TCLP analysis is indicated.

Section 5.3.2 QA/QC Samples: The correct frequency for field blank samples is one per ten, or fraction of ten, unless dedicated or disposable sampling equipment is used. Please revise throughout all relevant sections.

Section 5.3.3 Field Procedures, number 6: The text for VOC sample collection needs to be revised to include procedures for collection using Encore samplers.

Section 5.7.3 Groundwater Field Procedures: Section 5.7.1 indicates that redevelopment of existing wells may be necessary. Development procedures need to be included in this section. It is suggested that pH, temperature and specific conductance also have stabilization criteria as opposed to only turbidity. Typical purging stabilization parameters are three consecutive

measurements within the following criteria: ±0.25 units for pH, ±10 percent for specific conductance, and ± 1 degree C for temperature.

Section 5.7.3 Groundwater Field Procedures – Sampling Equipment Decontamination: This section needs to include decontamination procedures for the peristaltic pump, specifically the tubing. Will new tubing be used for each sample location? If not, is a diluted nitric acid solution going to be run through the tubing as indicated in the second bullet?

Section 5.8.1 Alluvial groundwater sampling Rationale/design: Why are dioxin samples not being collected? The QAPP contains a table which lists the total number of environmental samples by parameter and parameter (soil, sediment, VOC, SVOC). It is highly suggested that a table be prepared that lists number of samples by location (Site G, H, I, etc), by matrix (soil, sediment, groundwater, alluvial, etc), by parameter (VOC, SVOC, etc), and total # of QC samples (field blank, MS/MSD, trip blank, field duplicate, etc). Currently, it is difficult to determine the total number of monitoring well samples, vertical profile samples, upgradient and downgradient samples, trench samples, etc. It is also difficult to determine what parameters will be collected in each type of sample (sediment, soil, etc) and from each location (Site G, H, etc). Please provide a table to clarify the overall sampling scheme.

Section 5.11.1 Shallow Res. Well Sampling Rationale/Design: It is unclear how 6 groundwater samples was determined when the text states two locations (one on Walnut Street and one on Judith Lane). Does this include QC samples? Also, please clarify, these are new locations that will be sampled at residences with existing private wells. Will the existing residential wells be sampled?

Section 5.16 Upgradient groundwater sampling Rationale/Design: This section refers back to section 5.7 for redevelopment procedures. Redevelopment procedures are not detailed in section 5.7 but need to be included. See previous comment for Section 5.7.3 Groundwater Field Procedures.

Section 5.16.3 Field Procedures: This section refers back to section 5.7.3 for groundwater collection procedures. Section 5.7.3 details sample collection with a peristaltic pump. These may not be feasible for the push samples expected to be 60 and 100 feet bgs. The peristaltic pump may not be able to raise the water from those depths. An alternate method of sample collection should be discussed for the deeper samples.

Section 5.17.5 Field Procedures, number 3: The text for VOC sample collection needs to be revised to include procedures for collection using Encore samplers.

Section 5.17.5 Field Procedures, number 3: The QAPP (Section 5.1 Field Custody Procedures) and FSP (Section 6.1.2) indicates that sample labels and tags will be used for each sample container. Please revise for consistency.

Section 5.20 Sediment Sampling: Somewhere in the sediment sampling section the anticipated depth of the sediment sample (i.e. 0 to 0.5 ft) needs to be indicated. It should also be stated that sediment samples will be collected beginning at the most down gradient location and after collection of corresponding surface water samples.

General Comment for Section 5.0: Some sections include decontamination procedures and Investigative-derived waste procedures whereas other similar sections do not. Not all rational/ design sections include the number of samples (see comment Section 5.8.1 Alluvial groundwater sampling Rationale/design for procedure to clarify the number of samples).

Section 5.21.3 Surface Water Field Procedures: It is stated that the boat with the samplers and sampling equipment will be anchored at each location. If sediment samples will be collected on the same day, care should be taken to collect the sample upstream of the anchor location.

Section 8.0 Sample packaging and shipping: Sample transportation must comply with U.S. Department of Transportation requirements but it must also comply with ICAO/IATA (1999) regulations which govern overnight air carriers.

Other:

Discrepancy between Documents: Savannah Laboratory and Triangle Labs are indicated as the laboratories in support of both the Ecological Risk Assessment and Sauget Area 1 Support Sampling Plan. However, the accuracy and precision limits and other internal QC criteria are not consistent between the two QAPP/FSPs. For example, the MS/MSD accuracy and precision for phenol for the ecological risk assessment is listed as 26-90% recovery with a precision of 35%. The support sampling plan indicates 33-122 % recovery with a precision of 36% for aqueous samples and 13-115 % recovery with a precision of 39% for soil samples. The analytical methods are consistent between the two QAPPs. These limits should be reconciled between the two documents and with both laboratories. Also, the Ecological QAPP only indicates one set of accuracy and precision or control limits. However, the aqueous sample (field blanks) criteria may be different than the tissue (biota) samples, which typically correspond more with soil values. These discrepancies need to be resolved.

If you have any questions or require additional information, please contact the undersigned at (847) 918-4000.

Very truly yours,

ROY F. WESTON, INC.

Tonya Balla

Tonya Balla
Project Engineer

Tonya Balla
for

Gerald Almquist
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TB:GA:ieh